

This Method of Operation was prepared from Issue 13 of Drawing ES-239413.

#### METHOD OF OPERATION

Panel Machine Switching System - Dialing Set for Subscribers District Selectors

#### DEVELOPMENT

##### 1. PURPOSE OF CIRCUIT

- 1.1 This circuit is used for testing line switch or sender selector type line finder district selectors.

##### 2. WORKING LIMITS

- 2.1 None

#### OPERATION

##### 3. PRINCIPAL FUNCTIONS

- 3.1 This circuit is provided with a dial for directing the district selector to any desired bank and any group in that bank so as to enable the tester to observe its operation when making mechanical or electrical adjustments.
- 3.2 This circuit is arranged to prevent interference on busy line finder district selectors and to provide a busy signal.
- 3.3 A feature is provided for listening in on busy connections.
- 3.4 An adjustment key is provided to permit patching a relay test set for testing supervisory relays.
- 3.5 A coin station condition can be set up in order to pass a coin district thru the coin collect and coin return positions.

##### 4. CONNECTING CIRCUITS

- 4.1 This circuit functions with line switch or sender selector type line finder district selector circuits.

#### DESCRIPTION OF OPERATION

##### 5. PATCHING CORDS

Plug (RAT) is patched to the relay adjusting test box when adjusting supervisory relays or to the transmission test set when making

transmission tests. Plug (B) is patched to a battery and ground supply jack. Plug (BY) is patched to the test jack of the line finder district. When testing line finder districts, the plug (TST) is patched to the test jack of the start circuit. When testing the line switch districts, the plug (TST) is patched to the test jack of the district selector circuit and the (LS) key should be operated when figure 2 is provided. The (BY) plug is not used in connection with line switch type districts.

#### 6. TESTING LINE SWITCH DISTRICTS

In testing line switch districts the (TST) plug is inserted into the test jack of the district when the district is normal. Only "X" wiring is necessary for this test but should "Y" wiring be provided the (BY) plug is not used. When Figure 2 is provided, the (LS) key should be operated. To start the district functioning the (STM) key is operated connecting ground thru 100 ohms to the sleeve lead which operates the (SL) relay in the district. With the (RAT) key normal, the operator then dials the number of the bank and group to be tested.

#### 7. COIN TEST

The coin key (C) is operated, operating and locking the (C-1) relay to ground on the make contact of the (C) relay. The operation of the (C) relay lights the coin lamp, connects ground to the tip of the line and connects ground thru 100 ohms to the sleeve of plug (TST). When coin battery is supplied to the line by the district for collecting or refunding the coin the (C) relay operates releasing the (C-1) relay. When the coin battery is removed the (C) relay releases removing the ground from the tip side of the line. The coin lamp lights during the time interval corresponding to the time the coin is in the slot under actual conditions.

#### 8. TESTING BUSY LINE FINDER DISTRICTS "Y" WIRING FIG. 1

The (TST) plug is inserted in the test jack of the start circuit and (BY) plug is inserted in the test jack (T) of the line finder district. The ring and sleeve are of the (BY) jack short-circuited to close the "Z" lead to the (LF) relay. If the circuit to be tested is busy, ground on the make contact of the (E) relay in the line finder circuit over the tip of the (BY) cord operates the (BY) relay. The (BY) relay operated, (a) lights the busy lamp, indicating a busy condition on the district, (b) opens the tip of the line so that the dialing circuit cannot be closed should the (STM) key be operated, (c) opens the sleeve preventing the operation of the (A) relay in the start circuit should the (STM) key be operated.



9. When the test is made from the district frame a 726 cord 6 feet long is used at the line finder frame with a special 184 type plug per D-85619 (gray) on one end and a 110 plug on the other end (red), the gray plug to be used for the test jack in the line finder circuit under test and the red plug to be used at the "F" jack in line finder frame. The (BY) plug will be inserted at the "T" jack at district frame.
10. TESTING IDLE LINE FINDER DISTRICT "Y" WIRING FIG. 1
- When the (BY) plug is inserted into an idle line finder district the (BY) relay does not operate and the circuit functions normally, when the (STM) key is operated. When the (SLV) relay operates the circuit for the (BY) relay is opened so that it cannot operate when the (E) relay in the district operates during the test.
11. TESTING BUSY LINE FINDER DISTRICTS WITH FIGURE 2 - WHEN TIP SPRING OF THE (T) JACK IN THE DISTRICT IS WIRED TO THE SLEEVE OF THE (MB) JACK
- When the test set is connected to a busy line finder district and the (STM) key is operated the (T) relay will not operate due to its operating circuit being shunted by the ground which is connected to the winding of the (MB) relay in the line finder district. With the (STM) key operated and the (BY) relay normal the (BY) lamp will be lighted indicating a busy condition.
12. TESTING IDLE LINE FINDER DISTRICTS WITH FIGURE 2 - WHEN THE TIP SPRING OF (T) JACK IN THE LINE FINDER DISTRICT IS WIRED TO THE SLEEVE OF THE (MB) JACK
- When the test set is connected to an idle line finder district and the (STM) key is operated the (T) relay will operate from ground on the (STM) key over the tip of the (BY) cord to battery thru the winding of the (MB) relay in the line finder district. The (MB) relay will not operate in series with the high resistance winding of the (T) relay. The (T) relay causes the operation of the (BY) relay. The (BY) relay locks to the (STM) key and connects the line to the dialing circuit, also ground to the sleeve of the (TST) jack in the start circuit causing the operation of the (A) relay in the start circuit.
13. TESTING BUSY LINE FINDER DISTRICTS WITH FIGURE 2 - WHEN TIP SPRING OF (T) JACK IN THE DISTRICT IS WIRED TO THE BREAK CONTACT OF THE (MB) RELAY
- When the test set is connected to a busy line finder district and the (STM) key is operated the (T) relay will not operate due

to its operating circuit being open at the break contact on the (MB) relay. With the (STM) key operated and the (BY) relay normal the (BY) lamp is lighted indicating a busy condition.

14. TESTING IDLE LINE FINDER DISTRICTS WITH FIGURE 2 - WHEN THE TIP SPRING OF THE (T) JACK IN THE DISTRICT IS WIRED TO THE BREAK CONTACT OF THE (MB) RELAY

When the test set is connected to an idle line finder district and the (STM) key is operated the (T) relay will operate from ground on the (STM) key over the tip of (BY) jack to battery thru the winding of an (LF) relay in the first idle line finder. The (LF) relay will not operate in series with the high resistance winding of the (T) relay. The (T) relay causes the operation of the (BY) relay. The (BY) relay locks to ground on the (STM) key and connects the line to the dialing circuit, also ground to the sleeve of (TST) jack causing the operation of the (A) relay in the start circuit.

15. CLASS OF SERVICE KEY (CSV) (B WIRING)

With the (CSV) key operated the (A) relay only of the start circuit is operated since the 800 ohm resistance connected to the sleeve of the (TST) jack will non-operate the (A1) relay.

With the (CSV) key normal, both the (A) and (A1) relays operate.

The marginal relay in the district selector is operated with the (CSV) key normal and is non-operated with the (CSV) key operated. The (CSV) key should always be set before the start of a test call.

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